



AMENDED CLAIMS in Serial No. 07/357,797

Claims 1-8 are cancelled in response to Examiner's requirement for election.

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9. An arrangement comprising:

a gas discharge lamp having lamp terminals; *Fig 3*

a rectifier means having AC input terminals and, when provided with an appropriate AC voltage at its AC input terminals, being operative to provide an appropriate DC voltage as a set of DC output terminals; the appropriate AC voltage having a magnitude about equal to that of the voltage on an ordinary electric utility power line; ✓

frequency-converting ballast means having DC input terminals and high-frequency output terminals; the DC input terminals being connected with the DC output terminals; the high-frequency output terminals being: (i) connected with the lamp terminals; and (ii) operative, when provided with said appropriate DC voltage at its DC input terminals, to provide a high-frequency operating voltage to the lamp terminals, thereby to cause the lamp to emit light; and

screw-base means having base electrodes electrically connected with the AC input terminals; the screw-base means being operative to hold together the gas discharge lamp, the rectifier, and the frequency-converting ballast means such as to form an integral screw-in self-ballasted gas discharge lamp unit operative: (i) to be screwed into an ordinary Edison-type lamp socket having socket electrodes, thereby to cause electrical connection between the base electrodes and the socket electrodes; and (ii) to be properly powered by the AC voltage provided at the socket electrodes from an ordinary electric utility power line;

the arrangement being so constituted that direct electrical conduction may take place between the base electrodes and the DC output terminals, thereby to obtain the appropriate DC voltage without the need for interposing a power transformer in circuit between the base electrodes and the DC output terminals.

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lamp connected to base electrodes

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10. An arrangement comprising:

base means adapted to screw into and to be supported by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes whereat an AC voltage is provided; the base means having base electrodes making electrical contact with the socket electrodes whenever in fact the base means is screwed into said lamp socket;

rectifier means electrically connected with the base electrodes and operable to provide a DC voltage at a set of DC output terminals; there being an electrical conduction path

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between the base electrodes and the DC terminals;
gas discharge lamp means having a set of lamp terminals; and

inverter-type ballast means having a DC input and a high-frequency output; the DC input being connected in circuit between the DC output terminals and the lamp terminals;

the arrangement being so constructed as to constitute an integral self-ballasted gas discharge lamp unit operable to be screwed into and supported by said ordinary Edison-type lamp socket, thereby to be properly powered by a power line voltage provided thereat.

11. The arrangement of claim 10 wherein the gas discharge lamp means is a folded fluorescent lamp; the folded fluorescent lamp having a shape similar to that of a letter U.

12. An arrangement comprising:

base means adapted to screw into and to be supported by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes whereat an AC voltage is provided; the base means having base electrodes making electrical contact with the socket electrodes whenever in fact the base means is screwed into said lamp socket;

frequency-converting ballast means electrically connected with the base electrodes and operable to provide an alternating current at a set of output terminals; and

gas discharge lamp means having a set of lamp terminals connected with the output terminals; the gas discharge lamp means being characterized by having two substantially parallel columns of gas; which two columns of gas are connected with one another by way of a substantially transverse-oriented column of gas;

the arrangement being so constructed as to constitute an integral self-ballasted gas discharge lamp unit operable to be screwed into, supported by, as well as properly powered from said ordinary Edison-type lamp socket.

W 13. The arrangement of claim 12 wherein: (i) the two columns of gas each has a first cross-sectional area; and (ii) the transverse-oriented column of gas has a second cross-sectional area, the second cross-sectional area being substantially smaller than the first cross-sectional area.

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A₁ 14. The arrangement of claim 12 wherein the fundamental frequency of the alternating current is substantially higher than that of the AC voltage.

[Claims 15-18 are cancelled in response to Examiner's requirement for election.]

A₂ 19. A gas discharge lamp means operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes; the gas discharge lamp means comprising:

base means operable to be inserted into the Edison-type lamp socket; the base means having base electrodes operable to make electric contact with the socket electrodes; the base means also having a set of AC terminals from which is provided an alternating current of frequency substantially higher than the frequency of the AC power line voltage on an ordinary electric utility power line; and

gas discharge lamp having lamp terminals connected with the AC terminals, thereby to be properly powered by the alternating current provided therefrom; the gas discharge lamp being mounted on the base means and characterized by having two substantially parallel columns of gas, each column having a first cross-sectional area; the two columns of gas being connected with one another by way of a substantially transverse-oriented column of gas; the transverse-oriented column of gas having a second cross-sectional area; the second cross-sectional area being smaller than the first cross-sectional area.

20. A lamp means operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes; the lamp means comprising:

a gas discharge lamp having lamp terminals;

base means operable to be inserted into the Edison-type lamp socket; the base means having base electrodes operable to make electric contact with the socket electrodes; the base means also including a combination of:

(a) a rectifier means connected with the socket electrodes and operative to provide a DC voltage at a set of DC output terminals;

(b) an inverter means connected with the DC output terminals and operative to provide a high-frequency output current from a set of high-frequency output terminals; the high-frequency output current having a fundamental period; the inverter means including a transistor operative to conduct current in response to a control voltage provided at a control input; and

(c) an L-C means connected in circuit between the high-frequency output terminals and the lamp terminals; the L-C means being operative by way of resonant action to cause a substantially sinusoidal high-frequency voltage to be present across the tank-capacitor; the fundamental frequency of this high-frequency voltage being the same as that of the high-frequency current;

the combination being so arranged as to cause the transistor to conduct current for a brief span of time once during each fundamental period; the duration of said brief span of time being shorter than half the duration of said fundamental period.

21. A lamp means operable to be inserted into and held by an ordinary Edison-type lamp socket; the lamp socket having socket electrodes; the lamp means comprising:

a gas discharge lamp having lamp terminals;

base means operable to be inserted into the Edison-type lamp socket; the base means having base electrodes operable to make electric contact with the socket electrodes; the base means also including a combination of:

(a) a rectifier means connected with the socket electrodes and operative to provide a DC voltage at a set of DC output terminals;

(b) an inverter means connected with the DC output terminals and operative to provide a high-frequency output voltage from a set of inverter output terminals; the high-frequency output voltage having a substantially trapezoidal waveform with a fundamental period; the trapezoidal waveform consisting of: (i) first periods during which its magnitude is either uniformly rising or uniformly falling; and (ii) second periods during which its magnitude remains substantially constant; the duration of all the second periods being shorter than the duration of the complete fundamental period; and

(c) current-limiting means connected in circuit between the inverter output terminals and the lamp terminals.

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22. The lamp means of claim 21 wherein the duration of all the second periods in total is shorter than about 90% of the duration of the complete fundamental period.

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23. The lamp means of claim 21 wherein: (i) the inverter means includes a transistor operative to conduct current in response to the provision of a control voltage at a control input; (ii) the control voltage is being provided for a brief span of time during each fundamental period; and (iii) the duration of the brief span of time being less than half the duration of the complete fundamental period.
